SECTION 16460

TRANSFORMERS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work of this section consists of providing labor, materials, tools, appliances and miscellaneous accessories associated with the transformer work indicated herein and on the Drawings.

B. Types of transformers required for this project include the following:

1. Dry type transformers

1.2 RELATED DOCUMENTS

A. Drawings.

B. General provisions of Contract, including General and Supplementary Conditions.

C. Division 01 - Specification Sections.

D. Section 16010 - General Electrical Provisions.

PART 2 - PRODUCTS

2.1 TRANSFORMERS, GENERAL: Except as otherwise indicated, provide manufacturer's standard materials and components as indicated by published product information, designed and constructed as recommended by manufacturer, and as required for complete installation.

2.3 GENERAL PURPOSE DRY TYPE TRANSFORMERS

A. Provide factory-assembled, general-purpose, air-cooled, dry-type distribution transformers where shown; of sizes, characteristics, and rated capacities indicated.

B. Comply with NEMA Standard ST 20 "Dry-Type Transformers for General Applications".

C. Windings: 2-winding type. Three phase transformers shall use one coil per phase in primary and secondary.

D. Provide all copper windings with 75^0C rated terminal connections suitable for copper or aluminum wiring.

E. Transformers shall have the following features and ratings:

1. Enclosures: Provide terminal enclosure, with cover, to accommodate primary and secondary coil wiring connections and electrical supply raceway terminal connector. Equip terminal leads with connectors installed. Limit terminal compartment temperature to 75°C when transformer is operating continuously at rated load with ambient temperature of 40°C.

    a. Indoor - ventilated, dripproof. Apply manufacturer's standard light gray indoor enamel over cleaned and phosphatized steel enclosure.
    b. Outdoor - totally enclosed, nonventilated, suitable for outdoor use with fully-enclosed weather-resistant steel enclosures, and lifting lugs. Apply manufacturer's standard light gray outdoor enamel over cleaned and phosphatized steel enclosure.

2. Insulation Class: 185 degree C class for transformers 15 KVA or smaller; 220 degree C class for transformers larger than 15 KVA.
3. Insulation Temperature Rise: 150 degree C maximum rise above 40 degree C, for 220 degree C class insulation; 115 degree C maximum rise for 185 degree C class insulation.
4. Taps: For transformers 3 KVA and larger, full capacity taps in high-voltage winding as follows:

    a. 3 KVA through 10 KVA: Two 5 percent taps below rated high-voltage.
    b. 15 KVA through 300 KVA: Six 2-1/2 percent taps, 2 above and 4 below rated high-voltage.
    c. 500 - 1000 KVA: Four 2-1/2 percent taps, 2 above and 2 below rated high-voltage.

5. Sound Levels:

    a. Transformers shall have noise levels not exceeding the following when measured in accordance with appropriate ANSI standards for dry type transformers:

        (1). 1 - 9 KVA: 40 DB
        (2). 10 - 50 KVA: 45 DB
        (3). 51 - 150 KVA: 50 DB

    b. Core and coil assemblies shall be isolated from enclosure with suitable vibration absorbers.

F. Accessories: The following accessory items are required where indicated:

1. Wall mounting brackets: Manufacturers standard brackets for transformers sized up to 75 KVA where wall mounting is indicated.

PART 3 - EXECUTION

3.1 INSTALLATION OF TRANSFORMERS

A. Install transformers as indicated, complying with manufacturer's written instructions, applicable requirement of NEC, NEMA, ANSI and IEEE standards, and in accordance with recognized industry practices to ensure that products fulfill requirements.

B. Coordinate transformer installation work with electrical raceway and wire/cable work, as necessary for proper interface.

C. Install units on vibration mounts; comply with manufacturer's indicated installation method if any.

D. Connect transformer units to electrical wiring system; comply with requirements of other Division 16 sections.

E. Install label nameplate as required.

F. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Std 486A and B.

G. Mount transformer on housekeeping pad as described in Section 16051.

3.2 GROUNDING: Provide equipment-grounding connections for power/distribution transformers as required and/or indicated. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounding.

3.3 TESTING

A. Prior to energization of transformers, check all accessible connections for compliance with manufacturer's torque tightening specifications.

B. Prior to energization, check circuitry for electrical continuity, and for short-circuits.

C. Upon completion of installation of transformers, energize primary circuit at rated voltage and frequency from normal power source and test transformers, including, but not limited to, audible sound levels, to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

END OF SECTION